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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/763,375	01/23/2004	Tsuyoshi Kokusho	TOW-061	7566
959	7590	04/14/2006		
LAHIVE & COCKFIELD 28 STATE STREET BOSTON, MA 02109			EXAMINER EDGAR, RICHARD A	
			ART UNIT	PAPER NUMBER
			3745	

DATE MAILED: 04/14/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/763,375

**Applicant(s)**

KOKUSHO, TSUYOSHI

**Examiner**

Richard Edgar

**Art Unit**

3745

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-14 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-14 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 January 2004 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some \* c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>1/23/2004</u> . | 6) <input type="checkbox"/> Other: ____.  |

## **DETAILED ACTION**

### ***Priority***

Receipt is acknowledged of papers submitted under 35 U.S.C. 119(a)-(d), which papers have been placed of record in the file.

### ***Drawings***

The drawings are objected to because:

FIG. 1 does not utilize hatching as required by 37 C.F.R. §1.84(h)(3); and

The claimed intermediate layer, disposed between the casing and the coating, is not shown in the figures as required by 37 C.F.R. §1.83(a).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New

Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1, 3, 4, 5, 6, 8, 9, 11, 12 and 13 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent Application Publication 2002/0197155 (Howard et al. hereinafter) in view of United States Patent No. 5,059,095 (Kushner et al. hereinafter).

Howard et al. disclose a gas turbine engine abradable seal system comprising a coating having a porosity of 5% to 15% by volume (paragraph 0010). The system comprises a blade (paragraph 0008) and a compressor housing or liner (paragraph 0009) having the abradable seal therein. A bond coat is used between the substrate and the abradable seal material (paragraph 0009). The coating is a stabilized zirconia (paragraph 0011). To achieve the 5 to 15% by volume porosity, a particle size of 20 to 125 microns is used (paragraph 0011).

Howard et al. teach that the abradable seal material is plasma sprayed on, and not applied via HVOF, which inherently introduces an oxygen content.

Kushner et al. teach that an abradable seal material may be applied by plasma spraying as well as coated by a HVOF process (see col. 3, lines 15-24) for the purpose of producing a dense coating.

Since Howard et al. teach a plasma spraying process, and Kushner et al. teach that an HVOF process produces a dense coating, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to apply the Howard et al. coating by a HVOF process, as taught by Kushner et al. for the purpose of producing a dense coating. The HVOF process inherently produces an oxygen content like applicant's claimed invention.

Claims 1, 2, 3, 5, 8, 9, 10 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,233,822 (Grossklaus, Jr. et al. hereinafter) in view of United States Patent Application Publication 2002/0197155 (Howard et al. hereinafter).

Grossklaus, Jr. et al. teach a shroud for a gas turbine engine having an abradable material disposed thereon by an HVOF process (col. 5, line 24). The material is an MCrAlY material where M is selected from the group consisting of Co and Ni and combinations thereof (column 5, lines 12-16).

Neither the particle size nor the porosity of the material is specifically recited.

Howard et al. disclose a gas turbine engine abradable seal system comprising a coating having a porosity of 5% to 15% by volume (paragraph 0010). To achieve the 5 to 15% by volume porosity, a particle size of 20 to 125 microns is used (paragraph 0011).

Since Grossklaus, Jr. et al. teach an abradable shroud, and Howard et al. teach the abradable shroud should be porous, it would have been obvious at the time the invention was made to a person having ordinary skill in the art to modify the Grossklaus, Jr. et al. material to be 20 to 125 microns in size, which enables production of a 5% to 15% by volume, abradable liner.

Claims 7 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over United States Patent No. 6,233,822 (Grossklaus, Jr. et al. hereinafter) in view of United States Patent Application Publication 2002/0197155 (Howard et al. hereinafter) as applied to claims 2 and 10 above, and further in view of an engineering expedient.

Grossklaus, Jr. et al. teach a CoNiCrAlY powder material used to make the abradable shroud, however, do not recite the material having a composition of 32%Ni, 21%Cr, 7.5%Al and 0.5%Y (% by weight).

In order to form a strong bond, coatings are routinely made from a composition compatible with the substrate they are used with, when no bond coat is used. At the time the invention was made, it would have been obvious for a person having ordinary skill in the gas turbine engine art to utilize a CoNiCrAlY alloy shroud liner having a specific composition, including 32%Ni, 21%Cr, 7.5%Al and 0.5%Y, based on the

Art Unit: 3745

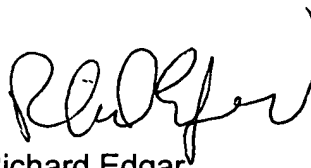
composition of the shroud the liner is sprayed onto, as well as the operating temperatures of the gas turbine engine, as an engineering expedient for the purpose of bonding the coating to the shroud.

***Contact Information***

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard Edgar whose telephone number is (571) 272-4816. The examiner can normally be reached on Mon.-Thur. and alternate Fri., 7 am- 5 pm EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Edward Look can be reached on (571) 272-4820. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Richard Edgar  
Examiner  
Art Unit 3745

RE